AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 | 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0001	11 JUN 98	PR#72-1279-98	

6. ISSUED BY CODE

CONTRACTING OFFICER
NAVAL RESEARCH LABORATORY
ATTN: CODE
WASHINGTON DC 20375-5326

7. ADMINISTERED BY *(If other than Item 6)* CODE

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, country, State and ZIP Code)*

CODE FACILITY CODE

(✓) X

9A. AMENDMENT OF SOLICITATION NO.
N00173-98-R-MN11

9B. DATED *(SEE ITEM 11)*
19 MAY 98

10A. MODIFICATION OF CONTRACT/ORDER NO.

10B. DATED *(SEE ITEM 13)*

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [ ] is extended, [X] is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning 2 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer x submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(✓)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103 (b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

SEE PAGE 2

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY *(Signature of Contracting Officer)*	16C. DATE SIGNED

The purpose of this amendment is to, clarify the drawings in attachment (1), and to respond to the following questions.

1. Drawings attached to the initial solicitation package are hereby deleted in their entirety and replaced with the drawings attached hereto. Hard copies are available.

2. Questions submitted as a result of the solicitation are answered as follows:

   Question – Item 2.2 of the specification titled" Testing of Welds" – "Will NRL supply standard test procedures or an estimate of the time that will be required to assist with the testing?

   Response – Standard test procedures will be provided upon request.

   Question – Can NRL supply a schedule that will be required to support Government testing?

   Response – The testing is estimated to take no more than three (3) days per can. The government will need two (2) weeks notice to schedule testing. The contractor is required to provide the place for testing and will need to provide assistance in moving the cans to the testing facility.

   Question – Has any company made these specific vacuum weldments before?

   Response – No

   ATTACHMENTS

Drawing No. PR-950402-7	(2 sheets)
Drawing No. PR-950301-3	(2 sheets)
Drawing No. PR-950301-3 detail	(1 sheet)
Drawing No. PR 950301-5	(2 sheets)
Drawing No. PR 950301-5 detail	(1 sheet)

DRAWING NO. PR-950402-7 **SCALE 1/1** **SHEET 1 OF 2**
OPTICAL INTERFEROMETER

NOTES: 1. TOLERANCES: .XX ± 1/8 ; .XXX ± 1/16 ; ANGLE ± 1/2°

2 MASK ALL $\sqrt{63}$ SURFACES DURING FINISHING PROCESSES.

a. REMOVE ALL SCALE, RUST AND OIL (CONTAMINANTS); SANDBLASTING PERMITTED

b. SPRAY ALL AEROGLAZE 9924 TWO PART WASH-PRIMER (THINNED WITH AEROGLAZE 9958) IN ACCORDANCE WITH AEROGLAZE SPECIFICATION SHEET TO ALL UN-MASKED SURFACES.

c. SPRAY APPLY AEROGLAZE Z-306 IN ACCORDANCE WITH AEROGLAZE SPECIFICATION.

d. AEROGLAZE WASH-PRIMER 9924 & AEROGLAZE Z-306 ARE TRADE NAME PAINT.

e. APPLY THIN FILM OF RUST INHIBITOR (i.e. WD/40) TO ALL NON PAINTED SURFACES FOR STORAGE.

3 VACUUM SEAL WELD TYPE. THE WELD MUST BE IMPERVIOUS TO HELIUM GAS WHEN CAN IS UNDER VACUUM AT 1 MILITORR. CONTACT OWNER FOR MORE DETAILS.

HOLES IN CYLINDER SHOULD BE CUT AS CONSISTANTLY AND ACCURATELY AS POSSIBLE. AN GAP BETWEEN THE HOLE IN THE CYLINDER AND THE OUTSIDE DIAMETER SHOULD BE AS SMALL PRACTICAL. IF FLAME OR PLASMA CUTTING PROCESSES ARE USED, THE CUT-EDGE SHOULD BE GROUND SO THAT IT IS SMOOTH AND FREE OF SLAG. tHE END OF THE TUBE TO BE WELDED AND THE AREA ON THE CYLINDER TO BE WELDED SHOULD BE CLEANED OF DIRT, RUST, AND MILL SCALE FOR A MINIMUM DISTANCE OF 1-INCH FROM THE WELD. THIS CAN BE DONE BY GRINDING, SHOT BLASTING, OR OTHER APPROPRIATE METHOD.

THE WELDING PROCEDURE AND THE WELDER SHOULD BE QUALIFIED TO A RECOGNIZED STANDARD OR CODE, SUCH AS: ASME BOILER AND PRESSURE VESSEL CODE SECTION IX, AWS STRUCTURAL WELDING CODE 01.1, OR A SUITABLE MILITARY STANDARD. USE GAS TUNGSTEN ARC WELDING (GTAW) AS A ROOT PASS. COMPLETE THE WELD WITH GAS METAL ARC WELDING (GMAW) PROCESS.

USE ELETRODE WIRE: 0.045-INCH DIAMETER ER70S-3 OR ER70S-6.
SHIELDING GAS: A MIXTURE OF ARGON AND CO2 RANGING FROM 75% AR-25%CO2 TO 92%AR-8%CO2.
WELDING CURRENT: DC ELECTRODE POSITIVE (DCRP) OF 220-270 AMPS.

OPTICAL INTERFEROMETER

WELDING VOLTAGE: 24-28 VOLTS.
CONTACT TIP TO WORK DISTANCE: 5/8 TO 3/4 INCH.

ALL WELDING SHOULD BE PERFORMED IN THE HORIZONTAL POSITION WITH THE AXIS OF THE TUBE BEING WELDED VERTICAL SO THAT THE WELD JOINT IS AT THE BOTTOM.

STRINGER BEADS SHOULD BE USED, WEAVING NOT PERMITTED. A 3/8-INCH FILLET SHOULD REQUIRE TWO OR THREE PASSES.

THE WELDING ARC MUST BE DIRECTED INTO THE ROOT OF THE JOINT AND ON THE LEADING EDGE OF THE WELD POOL TO MAXIMIZE FUSION AND PENETRATION.

A SPECIAL BACK-STEP TECHNIQUE IS REQUIRED FOR STARTS, STOPS AND TIE-INS BETWEEN WELD BEADS TO PREVENT FUSION DEFECTS.
THE ARC SHOULD BE STRUCK SLIGHTLY AHEAD OF THE START OF THE ARC AND THE ARC MOVED BACKWARD FROM THE NORMAL WELDING DIRECTION FOR A SHORT DISTANCE (1/4 INCH), THEN THE DIRECTION SHOULD BE REVERSED AND THE WELD PROGRESSION MADE AS NORMAL.

A SIMILAR TECHNIQUE SHOULD BE USED TO FILL WELD CRATERS AT THE END OF THE BEAD. GRIDING OF WELD STARTS TO TAPER THEM IS RECOMMENDED WHENEVER POSSIBLE PRIOR TO RE-STARTING THE NEXT BEAD.
IF MULTIPLE WELD PASSES ARE DEPOSITED, THE STOPS AND STARTS SHOULD BE STAGGERED FOR EACH PASS SO THAT THEY DO NOT OCCUR IN THE SAME LOCATION.

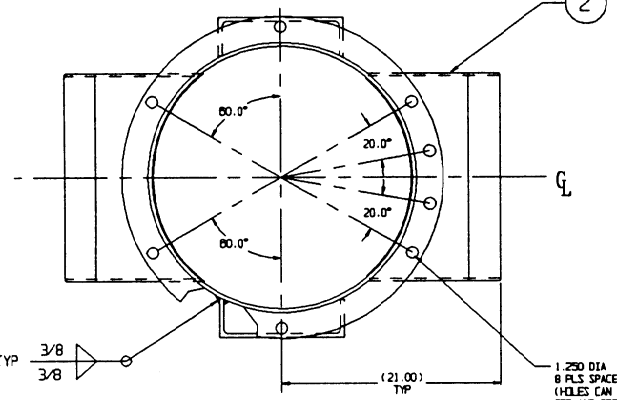
ENDS OF CAN TO BE MACHINED AFTER WELDING TO ACHIEVE REQUIRED FLATNESS.

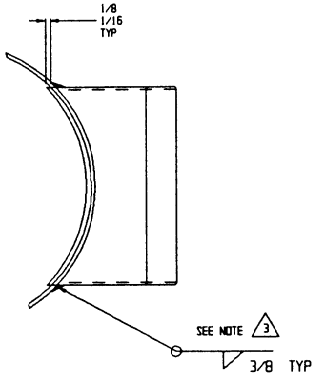
5. PROTECTIVE CAP REQUIRED ON ALL FINISHING SURFACES. A WOODEN CRADLE IS REQUIRED FOR SHIPPING AND STORAGE.

A WOODEN CRATE HOUSING CAN WELDMENT (AND CRADLE) REQUIRED FOR SHIPPING AND STORAGE ALSO.
DO NOT STACK CRATES DURING SHIPPING AND/OR STORAGE.

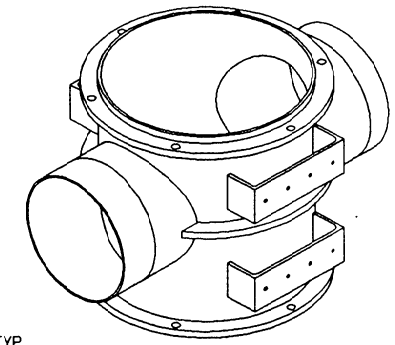
THIS SPECIFICATION SHEET APPLIES TO ALL CAN WELDMENTS OF THE N.P.O.I. PROJECT AND TO BE INCLUDED IN ALL CAN WELDMENT DRAWINGS

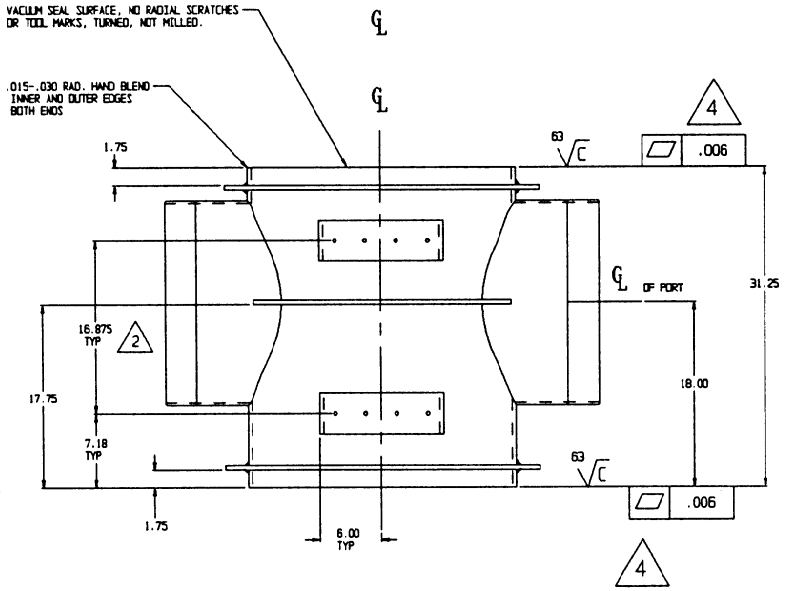
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED	3-01-95 L. HA	
B	REVISED, PORT WAS 19" O.D. REVISED NOTE 3, WELD OUTSIDE OF CAN	7-31-00 L. HA	
C	REVISED, MOVED NOTES AND ADDED DETAILED WELDING PROCEDURE (INTO DWG PR-950402-7 (TO BE ATTACHED)	11-11-97 L. HA	
D	REVISED, RECOMENSIONED LOCATION FOR BRACE (ITEM 5). ADDED NOTE 2.	12-03-97 L. HA	

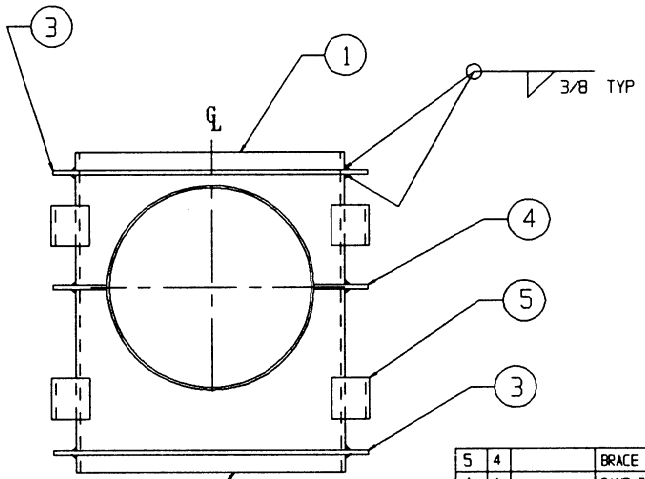




TYPICAL TUBING SET UP







VACUUM SEAL SURFACE, NO RADIAL SCRATCHES
OR TOOL MARKS, TURNED, NOT MILLED.

NOTE: 1. SEE SPECIFICATION DWG NO. PR-950402-7 (ATTACHED)

2. HOLES IN UPPER AND LOWER BRACES (ITEM 5) MUST BE IN LINE WITHIN .062" (USING A TEMPLATE OR FIXTURE IS RECOMMENDED).

SHEET 2 P/N :PR-950301-4

ITEM NO	REQ'D	DWG. OR PART NO.	DESCRIPTION	MATERIAL	VENDOR
5	4		BRACE - STEEL MC CHANNEL 12 X 31.0	STEEL CHANNEL	
4	1		BAND 31.00" O.D. X 26" I.D. X 1/2"	1020 LOW CARBON STEEL	
3	2		FLANGE 31.00" O.D. X 26" I.D. X 5/8"	1020 LOW CARBON STEEL	
2	2		20" O.D. X 1/4" WALL WELDED PIPE	1020 LOW CARBON STEEL	TIOGA PLATE CO.
1	1		26" O.D. X 3/8" WALL WELDED PIPE	1020 LOW CARBON STEEL	TIOGA PLATE CO.

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED-DIMENSIONS ARE IN INCHES
TOLERANCES ON: .XX .XXX ∠ FRACTIONS SURFACES
.13 .06 1° 1/64 125√
REMOVE ALL BURRS AND SHARP EDGES 0.02
DO NOT SCALE DRAWING
MATERIAL: SEE L.D.M. FINISH: SEE NOTE 2

	NAME	INIT	DATE
DESIGNED	LONG HA		
ENGINEER	J. CLARK		
CHECKED			
NEXT ASSY:	PR-950301-7		
MFG'D BY:	L D L		

CAN WELDMENT
DELAY STATION
LONG DELAY LINE

OPTICAL INTERFEROMETER
U. S. NAVAL OBSERVATORY
WASHINGTON, D.C.

DWG NO PR-950301-3

SCALE 1/6 SHEET 1 OF 2

FILE NAME PRT/PR-950301-3

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED	3-01-95 L. HA	
B	REVISED, PORT WAS 19" O.D. REVISED NOTE 3, WELD OUTSIDE OF CAN	7-31-96 L. HA	
C	REVISED, MOVED NOTES AND ADDED DETAILED WELDING PROCEDURE ONTO DWG PR-950402-7 (TO BE ATTACHED)	11-11-97 L. HA	
D	REVISED, REDIMENSIONED LOCATION FOR BRACE (ITEM 5). ADDED NOTE 2.	12-03-97 L. HA	

ITEM NO	REQ'D	DWG. OR PART NO.	DESCRIPTION	MATERIAL	VENDOR
5	4		BRACE - STEEL MC CHANNEL 12 X 31.0	STEEL CHANNEL	
4	1		BAND 31.00" O.D. X 26" I.D. X 1/2"	1020 LOW CARBON STEEL	
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1	1		26" O.D. X 3/8" WALL WELDED PIPE	1020 LOW CARBON STEEL	TIOGA PLATE CO

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED-DIMENSIONS ARE IN INCHES

TOLERANCES ON:

.XX	.XXX	∠	FRACTIONS	SURFACES
.13	.06	1°	1/64	125 ✓

REMOVE ALL BURRS AND SHARP EDGES R.02

DO NOT SCALE DRAWING

NAME	INIT	DATE
DESIGNER LONG HA		
ENGINEER J. CLARK		
CHECKED		

MATERIAL	FINISH
SEE L.O.M.	SEE NOTE 2

NEXT ASSY: PR-950901-7

USED ON: L D L

CAN WELDMENT

DELAY STATION

LONG DELAY LINE

SCALE 1/6

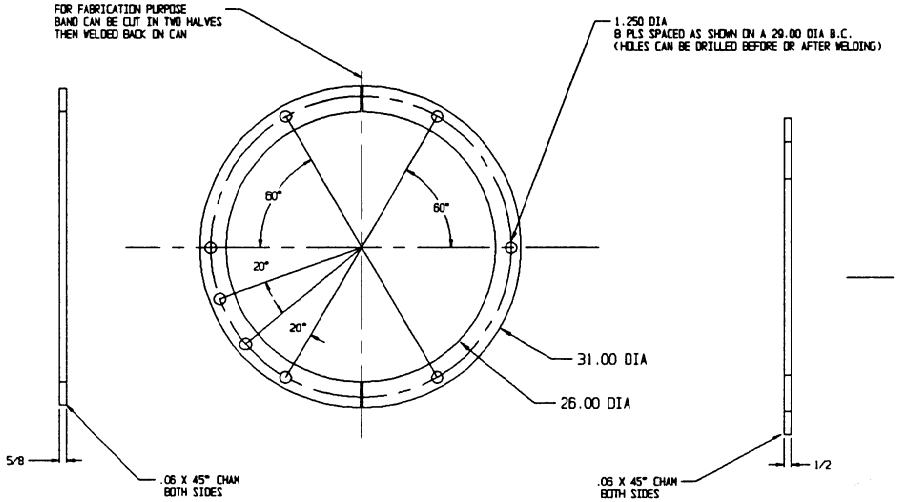
SHEET 1 OF 2

OPTICAL INTERFEROMETER

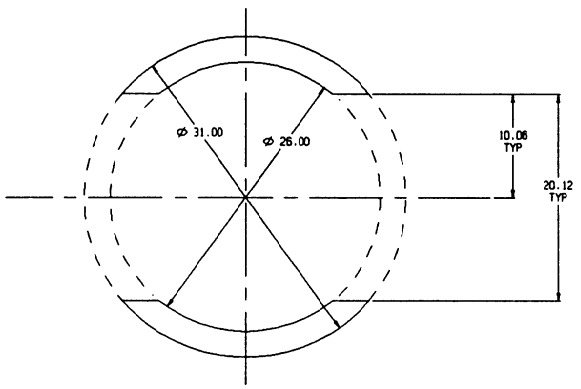
U. S. NAVAL OBSERVATORY
WASHINGTON, D.C.

DRG NO PR-950301-3

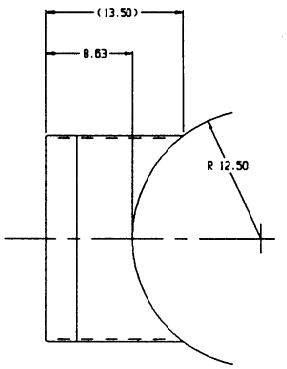
FILE NAME PRT/PR/950301-3

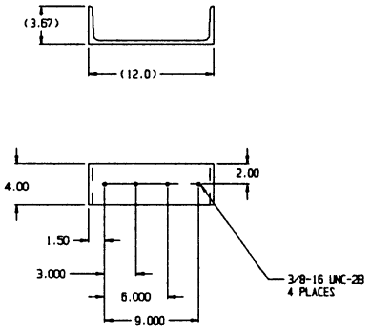


ITEM (3)



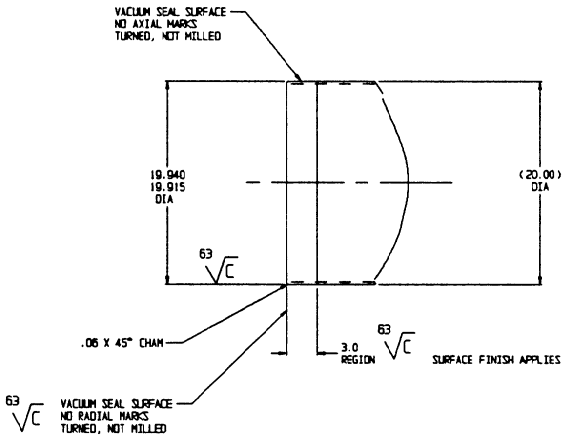
ITEM (4)





ITEM (5) 4 PLACES

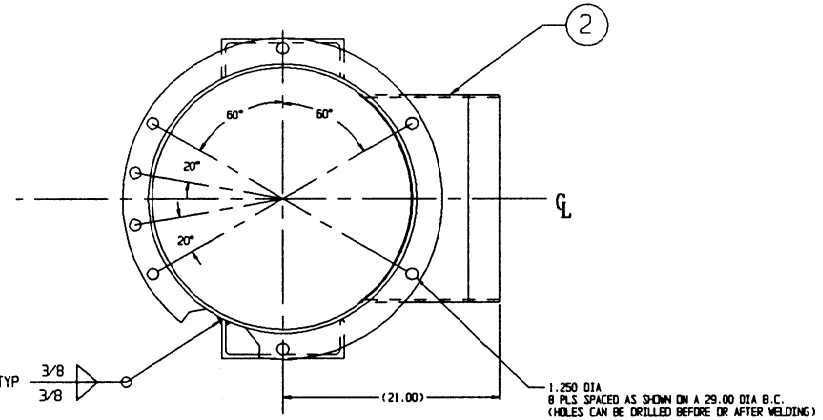
MATERIAL: STEEL MC CHANNEL MC12 X 31.0
(12.0 X 3.67 X .370)

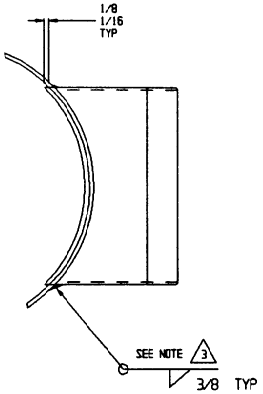


ITEM (2)

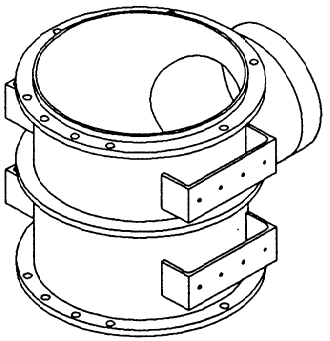
CAN WELDMENT DELAY STATION LONG DELAY LINE	OPTICAL INTERFEROMETER U. S. NAVAL OBSERVATORY WASHINGTON, D.C.
SCALE: 1/6 SHEET 2 OF 2	DWG NO PR-950301-3 FILE NAME PRT/PR/950301-4

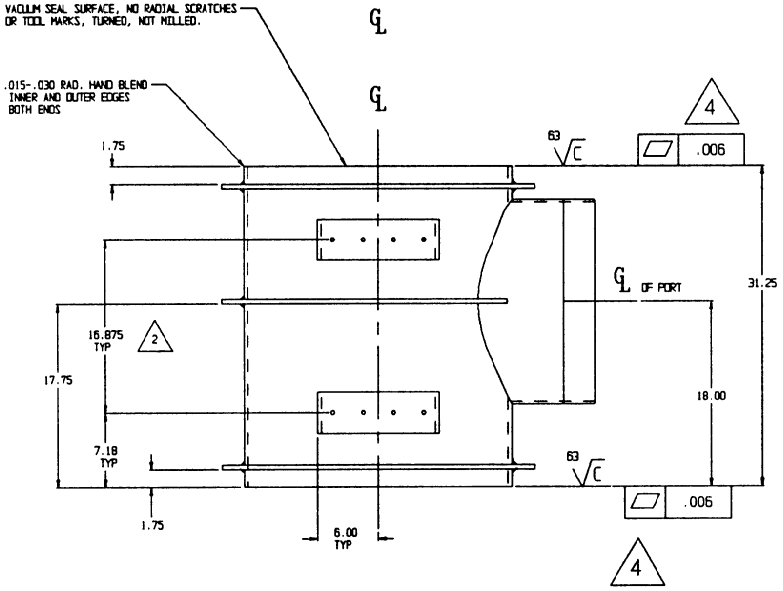
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED	3-01-95 L. HA	
B	REVISED, PORT WAS 19" O.D. ADDED TWO HOLES ON FLANGE, WELD OUTSIDE OF CAN	7-31-95 L. HA	
C	REVISED, NUMBERED NOTES AND ADDED DETAILED WELDING PROCEDURE ON DWG PR-950402-7 (TO BE ATTACHED)	11-11-97 L. HA	
D	REVISED, REDIMENSIONED LOCATION FOR BRACE (ITEM 5) ADDED NOTE 2.	12-03-97 L. HA	

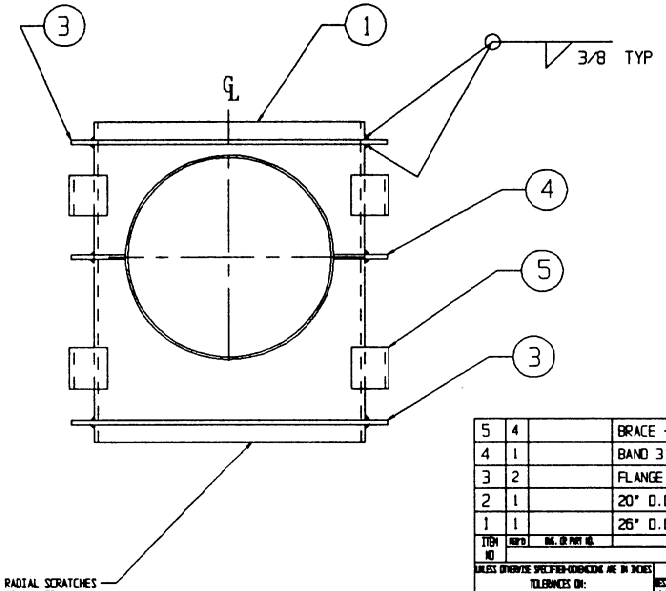




TUBING SET UP







VACUUM SEAL SURFACE, NO RADIAL SCRATCHES OR TOOL MARKS, TURNED, NOT MILLED.

NOTE: 1. SEE SPECIFICATION DWG NO. PR-950402-7 (ATTACHED)

2. HOLES IN UPPER AND LOWER BRACES (ITEM 5) MUST BE IN LINE WITHIN .062" (USING A TEMPLATE OR FIXTURE IS RECOMMENDED).

SHEET 2 P/N: PR-950301-6

ITEM NO	QUAN	DWG. OR PART NO.	DESCRIPTION	MATERIAL	VENDOR
5	4		BRACE - STEEL MC CHANNEL 12 X 31.0	STEEL CHANNEL	
4	1		BAND 31.00" O.D. X 26" I.D. X 1/2"	1020 LOW CARBON STEEL	
3	2		FLANGE 31.00" O.D. X 26" I.D. X 5/8"	1020 LOW CARBON STEEL	
2	1		20" O.D. X 1/4" WALL WELDED PIPE	1020 LOW CARBON STEEL	TIOGA PLATE CO.
1	1		26" O.D. X 3/8" WALL WELDED PIPE	1020 LOW CARBON STEEL	TIOGA PLATE CO.

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON: .XX ±.03 .XXX ∠ ±1° FRACTIONS ±1/64 SURFACES 125√
REMOVE ALL BURRS AND SHARP EDGES 0.02
DO NOT SCALE DRAWING

MATERIAL: SEE L.O.M. FINISH: SEE NOTE 2

	NAME	INIT	DATE
DESIGNED	LONG HA		
DRAWN	J. CLARK		
CHECKED			

NEXT ASSY: PR-950301-7
USED ON: L D L

CAN WELDMENT
DELAY - END STATION
LONG DELAY LINE

OPTICAL INTERFEROMETER
U. S. NAVAL OBSERVATORY WASHINGTON, D.C.

DWG NO PR-950301-5

SCALE 1/6 | SHEET 1 OF 2 | FILE NAME PRT/PR/950301-5

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASED	3-01-95 L. HA	
B	REVISED, PORT WAS 19" O.D. ADDED TWO HOLES ON FLANGE, WELD OUTSIDE OF CAN	7-31-96 L. HA	
C	REVISED, MOVED NOTES AND ADDED DETAILED WELDING PROCEDURE ON DWG PR-950402-7 (TO BE ATTACHED)	11-11-97 L. HA	
D	REVISED, REDIMENSIONED LOCATION FOR BRACE (ITEM 5) ADDED NOTE 2.	12-03-97 L. HA	

SHEET 2 P/N: PR-950301-6

ITEM NO	REQ'D	DWG. OR PART NO.	DESCRIPTION	MATERIAL	VENDOR
5	4		BRACE - STEEL MC CHANNEL 12 X 31.0	STEEL CHANNEL	
4	1		BAND 31.00" O.D. X 26" I.D. X 1/2"	1020 LOW CARBON STEEL	
3	2		FLANGE 31.00" O.D. X 26" I.D. X 5/8"	1020 LOW CARBON STEEL	
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1	1		26" O.D. X 3/8" WALL WELDED PIPE	1020 LOW CARBON STEEL	TIOGA PLATE CO.

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED-DIMENSIONS ARE IN INCHES

TOLERANCES ON:

.XX	.XXX	∠	FRACTIONS	SURFACES
.13	.06	1°	1/64	125 √

REMOVE ALL BURRS AND SHARP EDGES R.02

DO NOT SCALE DRAWING

MATERIAL	FINISH
SEE L.D.M.	SEE NOTE 2

NAME	INIT	DATE
DESIGNER LONG HA		
ENGINEER J. CLARK		
CHECKED		

NEXT ASSY: PR-950901-7

USED ON: L D L

CAN WELDMENT

DELAY - END STATION

LONG DELAY LINE

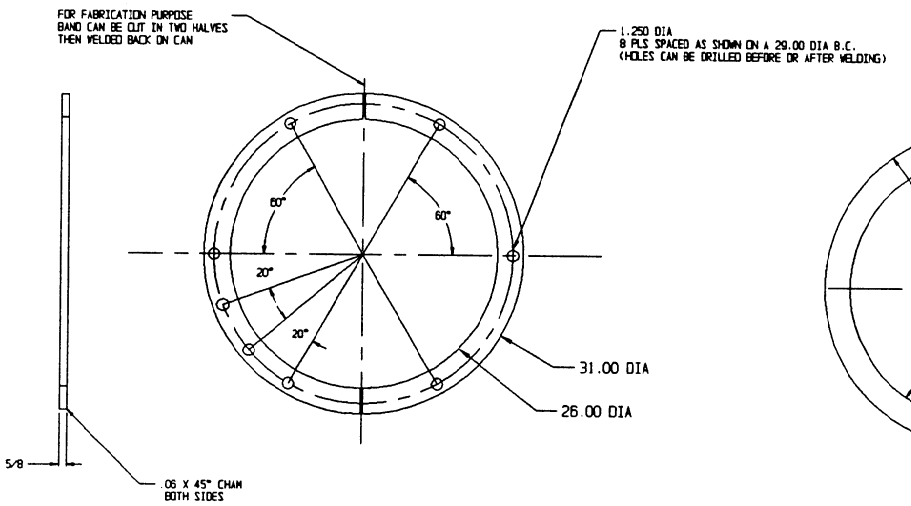
SCALE 1/6 | SHEET 1 OF 2

OPTICAL INTERFEROMETER

U. S. NAVAL OBSERVATORY
WASHINGTON, D.C.

DRG NO PR-950301-5

FILE NAME PRT/PR/950301-5



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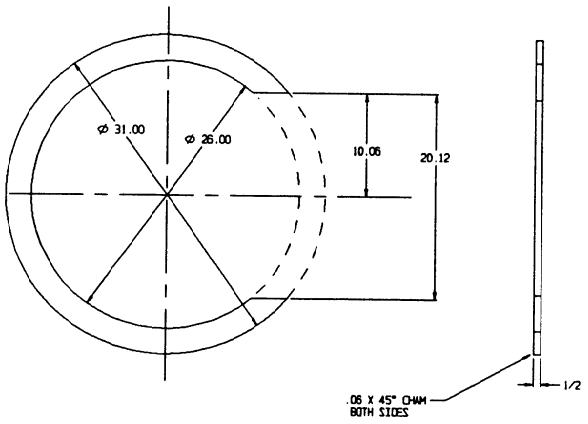
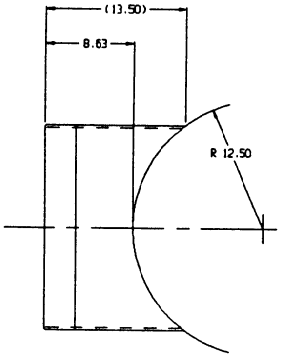
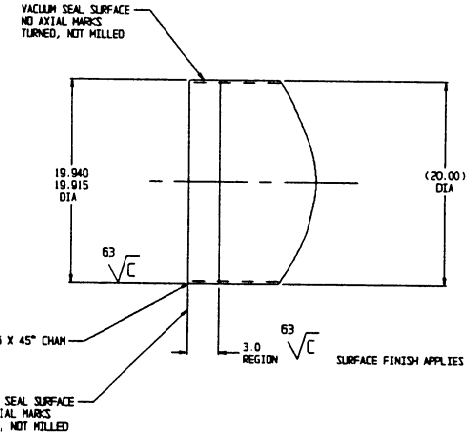
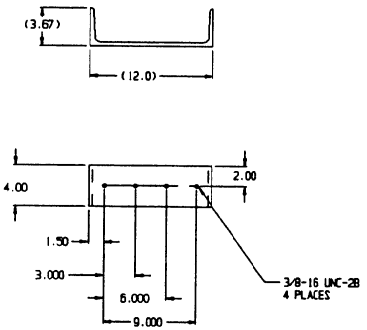


ITEM (4)





ITEM (2)



ITEM (5) 4 PLACES

MATERIAL: STEEL MC CHANNEL MC12 X 31.0
(12.0 X 3.57 X .370)

CAN WELDMENT DELAY END - STATION LONG DELAY LINE	OPTICAL INTERFEROMETER U. S. NAVAL OBSERVATORY WASHINGTON, D.C.
SCALE 1/6 SHEET 2 OF 2	DWG NO PR-950301-5 FILE NAME PRT/PR-950301-5